

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: **Thomas J. Nosker and  
Richard Renfree** Confirmation No.: **7140**

Application No.: **10/501,701** Examiner: **J. Mullis**

Filed: **May 5, 2005** Group Art Unit: **1711**

For: **COMPOSITIONS AND METHODS OF MAKING PLASTIC  
ARTICLES**

Attorney Docket No.: **70439.00026 (P34,035 USA)**

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**Mail Stop Amendment**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, VA 22313-1450**

**Rule 37 C.F.R. § 1.132 Declaration of Thomas J. Nosker, Ph.D.**

I, Thomas J. Nosker, Ph.D., declare and say that:

1. I am a Professor in the Department of Ceramic and Materials Engineering at Rutgers University, the assignee of the above-identified patent application. I am also a co-inventor on this application. I have over twenty years of experience in plastics recycling and immiscible polymer processing and behavior.

2. I am familiar with the prosecution history of U.S. Patent Application Serial No. 10/501,701 (the '701 application), at least to the extent that it is my knowledge that the application has been rejected as unpatentable in view of U.S. Patent No. 5,989,683 (the '683 patent), U.S. Publication No. 2002/0017743 (the '743 publication), International Publication No. WO96/07703 (the '703 publication) alone or in combination with U.S. Patent No. 5,937,521 (the '521 patent) or U.S. Patent No. 6,001,491 (the '491 patent), or U.S. Patent No. 5,334,647 (the '647 patent) in view of the '521 patent or the '491 patent. I am very familiar with these publications.

3. The '683 patent and the '743 publication disclose blends of polycarbonate and acrylonitrile butadiene styrene.

4. The '703 publication discloses blends of polycarbonate and substantially linear ethylene polymers. The density of the substantially linear ethylene polymers recited in the '703 publication is between about 0.850 to about 0.935 g/cc, preferably about 0.860 to about 0.900 g/cc (Page 8, lines 29-31).

5. The '647 patent discloses immiscible thermoplastic polymer blends.

6. The '521 patent discloses improvements in a method of extruding plastic members. The plastic matrices recited in the '521 patent include thermoplastic resins, such as high density polyethylene (HDPE), low density polyethylene (LDPE), linear low density polyethylene (LLDPE), polypropylene (PP), thermoplastic polyester (PET), or combinations thereof (Col. 4, lines 59-65).

7. The '491 patent discloses composite thermoplastic marine pilings. The thermoplastic compositions of the '491 patent include a polyolefin resin, a filler, and a functionalized compound (Col. 3, lines 53-64).

8. The claims of the present application are directed to immiscible polymer blends, which include high density polyethylene (HDPE) and acrylonitrile-butadiene-styrene (ABS) or polycarbonate (PC) or a mixture of ABS and PC, wherein said HDPE has a melt flow at 190°C/2.16Kg of less than about 1g/10min, and said PC, ABS or mixture of PC and ABS has a melt flow at 190°C/2.16Kg greater than about 1g/10min.

9. The Examiner considers the immiscible polymer blends of the present invention obvious in view of the references cited in paragraphs 3 and 4 allegedly because the polymer blends of the references appear to have the same properties exhibited by the blends of the present invention.

10. The Examiner considers the immiscible polymer blends of the present invention obvious in view of the '647 patent allegedly because all features of the blends of the present invention appear in the '647 patent, albeit never together in a single composition.

11. However, the references cited in paragraphs 3-5 do not disclose blends of HDPE and ABS, HDPE and PC, or HDPE, PC, and ABS. The '633 patent and the '743 publication do not disclose polyethylene. Additionally, the substantially linear ethylene polymers recited in the '703 publication are not HDPE. As recited at page 3, lines 31-32 of the present application, HDPE has a density greater than 0.940 g/cc. In contrast, the upper limit of the density of the ethylene polymers of the '703 publication is 0.935 g/cc. Furthermore, the '647 patent does not specifically disclose blends of HDPE and ABS, HDPE and PC, or HDPE, PC, and ABS.

12. Further, the data presented in Figures 3-5 and Tables II-IV of the present application, which are set forth below, indicates that the HDPE/ABS, HDPE/PC, and HDPE/PC/ABS blends of the present invention exhibited a modulus greater than what would have been expected based upon the additive contributions of each polymer to overall stiffness.

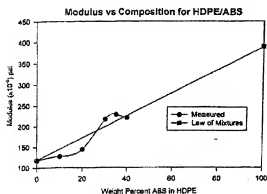


Figure 3.

TABLE II

Tensile properties of mixtures of ABS and HDPE

SAMPLE	MODULUS (psi)	ULTIMATE STRENGTH (psi)
100% ABS	128,000	2,700
90% HDPE		
20% ABS	145,000	2,800
80% HDPE		
30% ABS	218,000	3,300
70% HDPE		
35% ABS	226,000	3,400
65% HDPE		
40% ABS	232,000	3,500
60% HDPE		
100% ABS	240,000	3,500

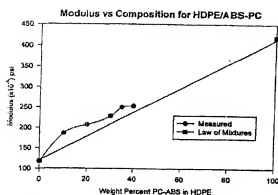


Figure 4.

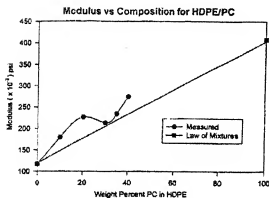


Figure 5.

13. The linear plot in each of Figures 3-5 shows the modulus of various mixtures of HDPE/ABS, HDPE/PC, and HDPE/ABS/PC based on the law of mixtures. The curved line shows that the blends actually exhibited a modulus greater than what would have been expected based upon the additive contributions of each polymer to overall stiffness. Therefore, the HDPE/ABS, HDPE/PC, and HDPE/ABS/PC blends represent an inventive step over the state of art identified by the Examiner.

TABLE III

Tensile properties of mixtures of PC/ABS and HDPE		
SAMPLE	MODULUS (psi)	ULTIMATE STRENGTH (psi)
10% PC/ABS	189,000	3,100
90% HDPE		
20% PC/ABS	207,000	3,300
80% HDPE		
30% PC/ABS	226,000	3,400
70% HDPE		
40% PC/ABS	243,000	3,600
60% HDPE		
50% PC/ABS	253,000	4,000
40% HDPE		
60% PC/ABS	418,000	4,200
40% HDPE		
PC/ABS	418,000	5,000

TABLE IV

Tensile properties of mixtures of PC and HDPE		
SAMPLE	MODULUS (psi)	ULTIMATE STRENGTH (psi)
10% PC	179,000	3,100
90% HDPE		
20% PC	226,000	3,400
80% HDPE		
30% PC	213,000	3,800
70% HDPE		
35% PC	234,000	4,100
65% HDPE		

TABLE IV-continued

Tensile properties of mixtures of PC and HDPE		
SAMPLE	MODULUS (psi)	ULTIMATE STRENGTH (psi)
40% PC	274,000	4,200
60% HDPE		
PC DRY	408,000	5,000

14. I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true and further that the statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Thomas J. Nosker, Ph.D.  
Thomas J. Nosker, Ph.D.

1/15/08  
Date